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THE JAPANESE PYROCHROID GENUS *TOSADENDROIDES* KÔNO, 1935: A NEW JUNIOR SYNONYM OF *PEDILUS* FISCHER VON WALDHEIM, 1822 (COLEOPTERA: PYROCHROIDAE: PEDILINAE)

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Abstract.—Critical examination of the monotypic Japanese genus *Tosadendroides* Kôno, 1935 suggests that it is synonymous with *Pedilus.* Genitalic characters and secondary sexual characteristics associated with the antennae and elytra of the male are clearly congeneric with *Pedilus* Fischer von Waldheim, 1822, as is the venation of the metathoracic wings. None of these character states are found in pyrochroine taxa. With this proposed change, *okamotoi* Kôno becomes the first *Pedilus* recorded from Japan, and *Tosadendroides* NEW SYNONYM, is established as a junior synonym of *Pedilus.*

Key Words.—Insecta, Coleoptera, Pyrochroidae, *Tosadendroides, Pedilus,* synonymy

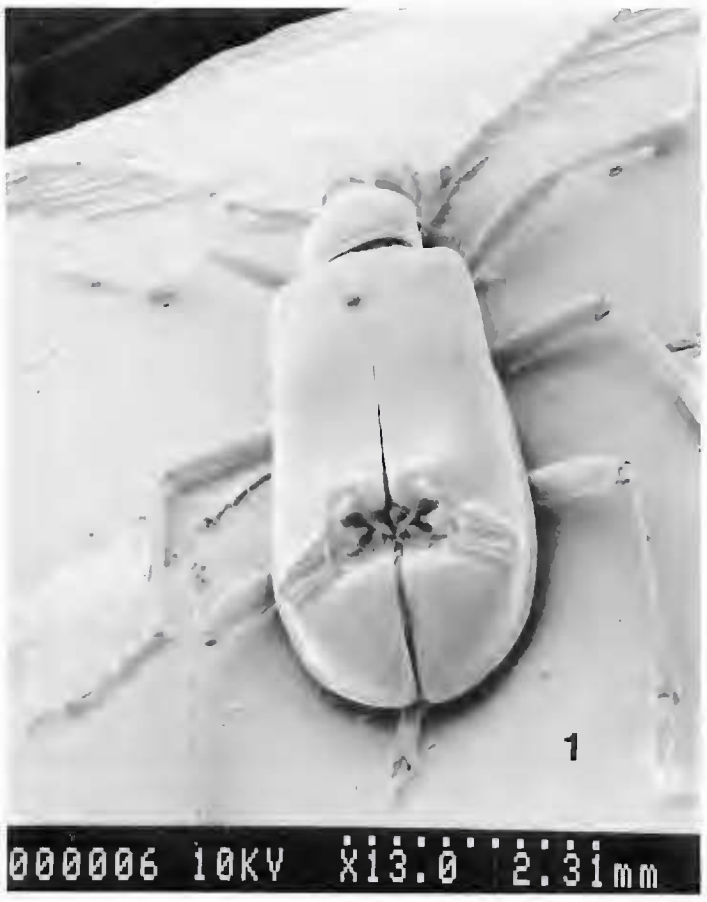
The monotypic *Tosadendroides* was erected by Kôno (1935) for *T. okamotoi* Kôno, a species indigenous to Shikoku, the smallest of the main Japanese islands, wedged between the southwestern arm of Honshu and northeastern Kyushu. Sadanari Hisamatsu sent me an individual of this beetle, unique because of the highly modified elytral apices of the male (Figs. 1–3). Striking cranial modifications are commonly encountered in the males of several pyrochroine genera (cranial pits, sensu Young 1975). On the other hand, sexually dimorphic elytral modifications are well known in pediline pyrochroids belonging to *Pedilus.* Because of this inconsistency, a closer examination of *Tosadendroides* was made, and a redescription of *T. okamotoi* is presented. Further, *Tosadendroides* is synonymized with *Pedilus.*

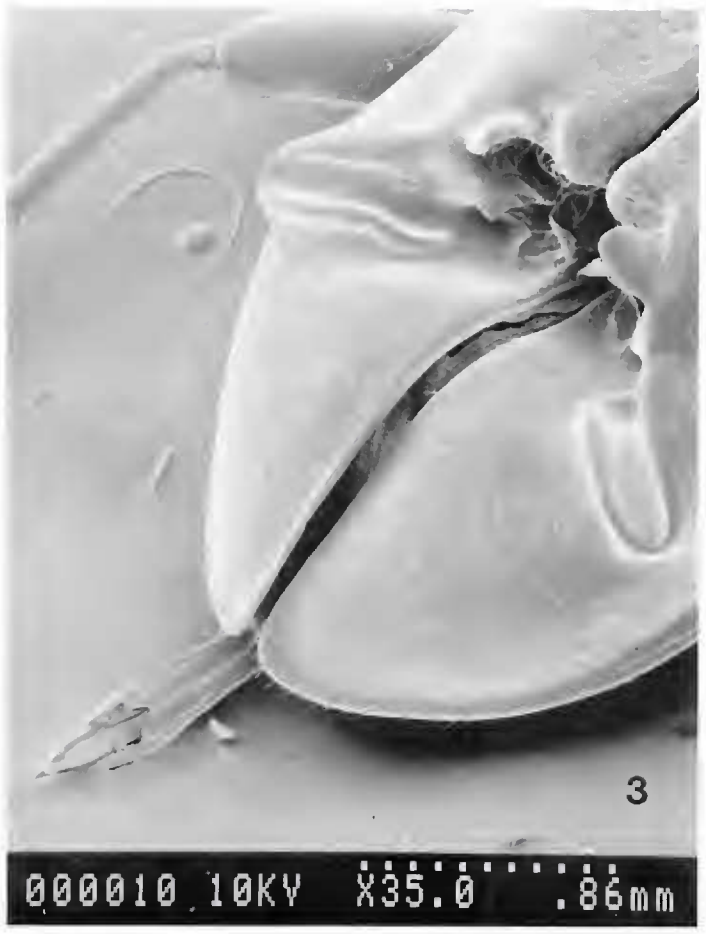
PEDILUS OKAMOTOI (KÔNO, 1935)

Tosadendroides okamotoi Kôno, 1935. Insecta Matsumurana 9: 157–161. NEW SYNONYM

Types.—Holotype: male; JAPAN. *SHIKOKU:* Mt. Kamegamori, 2 Jul 1934, Hiroshi Okamoto; type not examined, repository unknown.

Description.—Male: Length 8.0–8.2 mm. Head black, rufopiceous near base of "neck"; prothorax, coxae, trochanters, femora, basal three-quarters of elytra and abdominal sternites three through six rufopiceous; ventrally exposed mesothorax and metathorax piceous to black; labrum, palpi, antennal segments one through three, distal one-quarter of elytra, abdominal sternites seven through eight and external genitalia yellow-brown; tibiae testaceous; antennomeres four through eleven and tarsi yellow-brown basally to rufopiceous distally. Head (Fig. 4) narrowed immediately behind eyes, sparsely and shallowly punctate except "neck" coarsely sculptured, vertex bearing shallow, mesal canaliculus. Antennae (Fig. 5) flabellate beyond segment two. Pronotum subovate, widest slightly anteriad of middle, vestiture of sparse, short setae, surface sparsely, finely punctulate. Prothoracic and mesothoracic tarsi no more dilated and tomentose beneath than metathoracic tarsi; tarsal claws each with a small, poorly developed basal tooth. Elytral surface (Figs. 1–3) sparsely setulose, basal three quarters punctate, apex sparsely, shallowly punctulate; elytra with apical one-half (Fig. 1–3) highly modified. Metathoracic

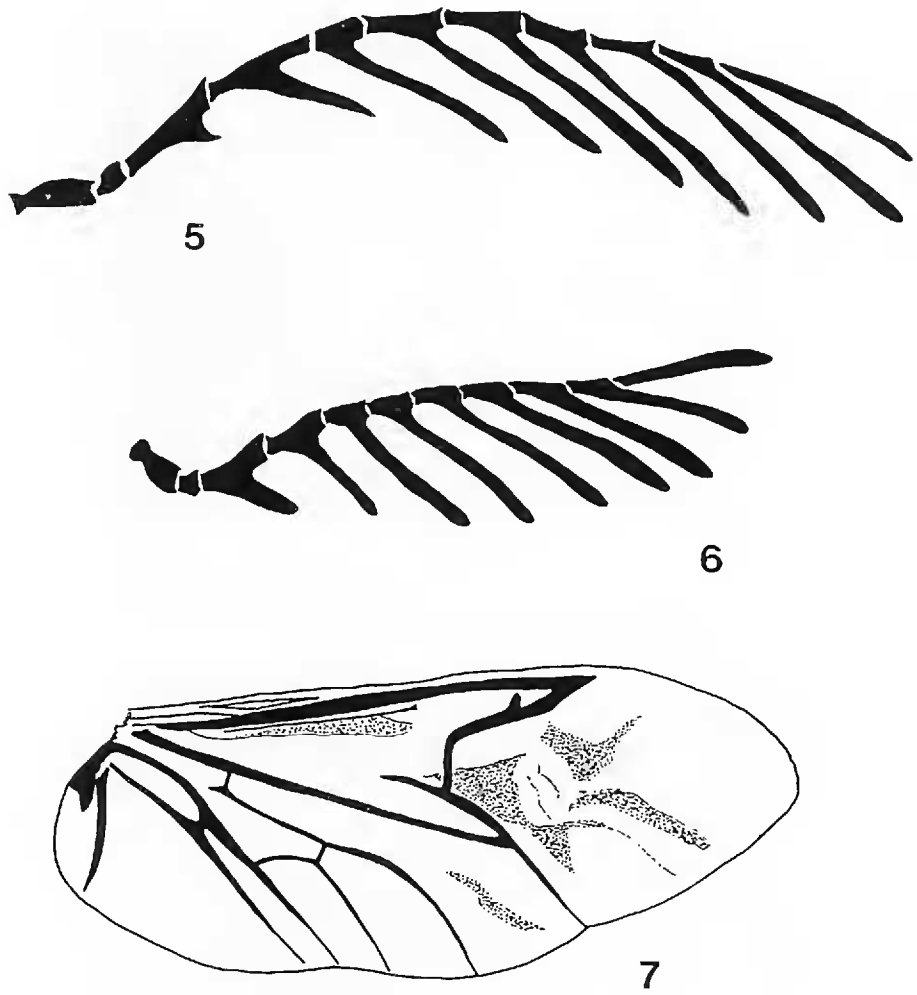




Figures 1–4. *Pedilus okamotoi* (Kôno), male. Figure 1. Habitus, posteriodorsal view. Figures 2, 3. Elytral apices. Figure 4. Anteriodorsal view of head.

wing (Fig. 7) with radial cell open narrowly. Posterior margin of eighth abdominal sternite broadly emarginate. Parameres (Figs. 9, 10) fused proximally, widely separated and subparallel distally, each bearing setae dorsolaterally along distal one-half, and narrowly rounded apically, forming an inwardly projecting subapical tooth from the inner dorsal surface; median lobe shallowly excavated ventrally, apex narrowly rounded.

Female.—External anatomy similar to male except: antennae serrate, elytra not modified, posterior margin of eighth abdominal sternite entire.



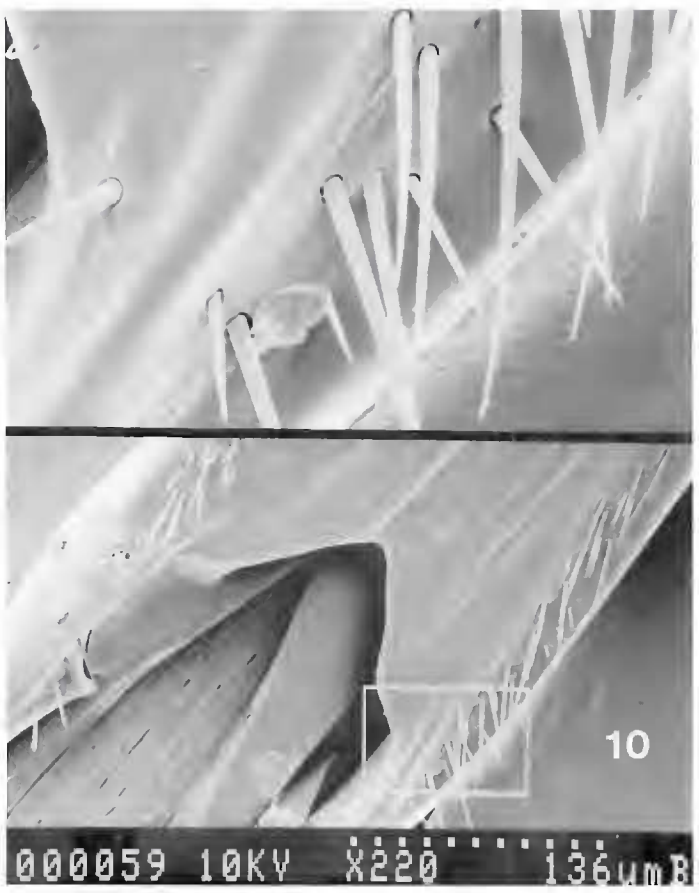
Figures 5–8. Figure 5. *Pedilus okamotoi* (Kôno), male, right antenna. Figure 6. *Pedilus parvicollis* Fall, male, right antenna. Figure 7. *Pedilus okamotoi* (Kôno), male, right metathoracic wing. Figure 8. *Pedilus lugubris* (Say), male, right metathoracic wing.

Diagnosis.—*Pedilus okamotoi* males can be distinguished from males of all other *Pedilus* by the unique combination of flabellate antennae (Fig. 5) and configuration of elytral apices (Figs. 1–3). The species is also the only *Pedilus* from Japan.

Material Examined.—JAPAN. *SHIKOKU:* Mt. Tsurugi, 7 Jun 1970, S. Hisamatsu, 1 male; Tsuchigoya, Ehime Pref., 13 Jun 1980, M. Kotani, 1 female; Yanadani-Mura, Kamiukena-Gun, Ehime Pref., 4 Jun 1988, Y. Ito, 1 male.

Discussion

Upon examination of *Tosadendroides,* I am convinced that it is synonymous with *Pedilus.* In addition to the sexually dimorphic elytral modifications already described (Figs. 1–3), the radial cell of the metathoracic wing (Fig. 7) is narrowly open. This is also characteristic for *Pedilus* (Fig. 8), and unlike the entirely open radial cell in all Pyrochroinae I have examined. The orientation and configuration



Figures 9, 10. *Pedilus okamotoi* (Kôno), male genitalia. Figure 9. Parameres and median lobe. Figure 10. Setation of parameres (lower frame) with inset blown up (upper frame).

of the male genitalia also provide useful diagnostic characters. Pyrochroinae exhibit normal heteromeroid genitalia with the tegmen (= parameres + basal piece) oriented dorsad of the median lobe. In *Tosadendroides* and *Pedilus,* the male genitalia are generally of the inverted type, although it is not uncommon to see individual specimens in which the orientation has become reversed (Figs. 1–3), presumably through torsion, as has commonly been noted in certain Diptera.

The question of generic placement for *okamotoi,* led me to recall a similar case regarding *Pedilus parvicollis* Fall (1919). Like *P. okamotoi, P. parvicollis* males have antennae that are flabellate beyond the second segment (Fig. 6). Furthermore,

the cranium is not produced behind the eyes as is typical of many *Pedilus* species. These characters, which are far more suggestive of the pyrochroine genus *Dendroides,* led Van Dyke (1928) to challenge Fall's generic placement. In rebuttal, Fall (1929) presented convincing evidence that *P. parvicollis* was correctly assigned to *Pedilus* and that similarities to *Dendroides* were due to convergence. Young (in press) comments further on this and provides evidence to support evolutionary convergence between *Dendroides* and the *flabellatus* species group of *Pedilus* [= *P. flabellatus* (Horn) and its sister species, *P. parvicollis*].

As a *Pedilus, okamotoi* shares likenesses to both the *flabellatus* and *punctulatus* species groups as defined by Young (in press). The antennae of *P. okamotoi* (Fig. 5) and *P. parvicollis* (Fig. 6) are nearly identical. However, the male genitalia of *okamotoi* closely resemble those of the *cavatus* subgroup of the *punctulatus* species group (Young, in press). Those of *P. parvicollis* and *P. flabellatus* are more closely related to certain Russian species. Because Eurasian *Pedilus* have not been formally reviewed or examined within a modern conceptual framework, it seems best to defer the question of where, within *Pedilus, okamotoi* might be placed. It is, without doubt, a *Pedilus* (Pedilinae), however, and not a pyrochroine. Thus, *Tosadendroides* Kôno represents a new synonym for *Pedilus* and the proper designation for *T. okamotoi* becomes, *Pedilus okamotoi* (Kôno). With the proposed change, *P. okamotoi* becomes the first *Pedilus* to be recorded from Japan. *Pedilus* is also known from Eurasia and North America north of Mexico.

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Literature Cited

Fall, H. C. 1919. New Coleoptera VIII. Can. Entomol., 51: 212–216.

Fall, H. C. 1929. *Pedilus parvicollis* not a *Dendroides.* Bull. Brooklyn Entomol. Soc., 24: 13–14.

Kôno, H. 1935. Drei neue Heteromeren aus Japan und Formosa, mit einer Liste der geographischen Verbreitung der japanischen Pyrochroiden und Pediliden. Insecta Matsumurana, 9: 157–161.

Van Dyke, E. C. 1928. New species of heteromerous Coleoptera. Bull. Brooklyn Entomol. Soc., 23: 251–262.

Young, D. K. 1975. A revision of the family Pyrochroidae (Coleoptera: Heteromera) for North America based on the larvae, pupae, and adults. Contrib. Amer. Entomol. Inst., 11: 1–39.

Young, D. K. (in press). Bionomics, phylogeny and systematics of the North American species of *Pedilus* Fischer (Coleoptera: Pyrochroidae). Knull Ser., Ohio J. Sci.

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